UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,596	03/07/2002	Peter Magnus Petersson	2380-592	7687

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EXAMINER
NGUYEN, THUAN T

ART UNIT	PAPER NUMBER
2618	

DATE MAILED: 09/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
	10/091,596	PETERSSON ET AL.
Office Action Summary	Examiner	Art Unit	
	THUAN T. NGUYEN	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.

2a) ☒ This action is **FINAL.**   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-6,9,17-26,29-33 and 35-37* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-6,9,17-26,29-33 and 35-37* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1. ☐ Certified copies of the priority documents have been received.

   2. ☐ Certified copies of the priority documents have been received in Application No. _____.

   3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Remark

1.   Claims 7-8, 10-16, 27-28, and 34 have been previously canceled.   Pending claims

are claims 1-6, 9, 17-26, 29-33, and 35-37.

Response to Arguments

2.   Applicant's arguments with respect to claims 1-6, 9, 17-26, 29-33, and 35-37 have been

considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> *(a) A patent may not be obtained though the invention is not identically disclosed or*
> *described as set forth in section 102 of this title, if the differences between the subject*
> *matter sought to be patented and the prior art are such that the subject matter as a whole*
> *would have been obvious at the time the invention was made to a person having ordinary*
> *skill in the art to which said subject matter pertains. Patentability shall not be negatived*
> *by the manner in which the invention was made.*

4.   Claims 1-6, 9, 17-26, 29-33, and 35-37 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Schick et al. (U.S. Patent No. 5,970,053) in view of Hoenninger, III (U.S.

Patent No. 5,739,691).

        Regarding claim 1, Schick discloses an apparatus (Fig. 1) comprising: a mixer for mixing

a received signal and a local oscillator signal and generating an analog, frequency converted

signal (Fig. 1, item 168 for a mixer in mixing a received signal from program source signal 102-

1...102-83 and a local signal oscillator (LO) from LO 170 to analog frequency converted signal

or frequency modulated signal –with modulators 116-1 to 116-83, see col. 4/line 58 to col. 5/line

19 and col. 6/line 28 to col. 7/line 34), and an analog-to-digital converter for converting the

analog, frequency-converted signal into a corresponding digital signal (Fig. 1/item ADC 192 for

analog-to-digital converter for converting analog frequency converted signals to corresponding

digital signals, see col. 8/lines 43-67); and wherein a frequency of the local oscillator signal is set

in relation to a frequency of a sampling rate of the analog-to-digital converter to avoid aliasing in

the desired receive band, i.e., this is from the Nyquist theorem principal as the minimum

sampling rate should be at least twice that of the highest frequency component of the signal

being sampled to <u>avoid aliasing</u> (col. 6/lines 52-67 and col. 10/lines 1-26 for examples of the

frequency of the local oscillator signal is an integer multiple of half of a sampling rate of the

analog-to-digital converter, see equation 7 as F fund (fundamental or reference frequency)

considering for Frequency from the LO is 6 MHz (half of the sampling rate), while F sync for

sampling rate is 12 MHz (twice) with I/J is a coefficient for integers).

Schick further suggests "wherein the apparatus is used in a receiver without a filter

between the mixer and the analog-to-digital converter", i.e., although a filter 182 is included, yet

Schick notes that it is only preferable to (have filter) have ample attenuation to ensure that

aliased signal levels is below a defined bit-weight of ADC, this suggests an option in including

the filter based on ADC's type and designing configuration of the receiver (col. 8/line 58 to col.

9/line 19). Furthermore, Hoenninger clearly teaches within an RF receiver, a mixer is directly

coupled to an analog-to-digital converter without a need for a filter (refer to Fig. 2, for mixer or

RF amplifier 156 is connected to ADC 166 without a filter in between) although the same

objective is to avoid aliasing in ADC (refer to col. 1/lines 24-37). Therefore, it would have been

obvious to one of ordinary skill in the art to modify Schick's system with the suggestion of

Schick and the teaching of Hoenninger to have a filter as an option between the mixer and the

ADC within the RF receiver as desired.

For claims 2 and 3, in view of claim 1, Schick discloses "wherein the frequency of the

local oscillator signal is an integer multiple of half of the sampling rate of the analog-to-digital

converter" (refer to claim 1 above) and "wherein the frequency of the local oscillator signal F

LO is F LO = n * F ADC/2, where F ADC is the sampling rate of the analog-to-digital converter,

and n is a positive integer", i.e., this is from the Nyquist theorem principal as the minimum

sampling rate should be at least TWICE that of the highest frequency component of the signal

being sampled to avoid aliasing (col. 6/lines 52-67 and col. 10/lines 1-26 for examples of the

frequency of the local oscillator signal is an integer multiple of half of a sampling rate of the

analog-to-digital converter, see equation 7 as F fund (fundamental or reference frequency)

considering for Frequency from the LO is 6 MHz (half of the sampling rate), while F sync for

sampling rate is 12 MHz (twice) with I/J is a coefficient for integers).

For claim 4, in view of claim 1, Schick further discloses "comprising: an oscillator for

generating a periodic signal, wherein the periodic signal is used to generate both the local

oscillator signal and a sampling rate signal for the analog-to-digital converter" (Fig. 1, item 170,

and col. 6/line 52 to col. 7/line 54 for LO 170 and corresponding PLL in providing S LO, S RF

and S IF , or other words, LO in generating the periodic signal is used to generate both the local

oscillator signal and a sampling rate signal for the analog-to-digital converter ADC 192).

For claim 5, in view of claim 4, Schick further discsloses "comprising: a frequency

changer, receiving the periodic signal from the oscillator, for providing the local oscillator signal

to the mixer and a sampling rate signal to the analog-to-digital converter" (Fig. 1/item 208 and

col. 10/lines 1-50 for a frequency divider in changing the frequency and under the control of LO

170 in providing the local oscillator signal 170 to the mixer 168 and a sampling rate signal to the

analog-to-digital converter ADC 192, and Fig. 8 is a closer up view of frequency divider 208).

For claim 6, in view of claim 5, Schick discloses "wherein the frequency changer

includes a first frequency divider for dividing the periodic signal in half to generate the local

oscillator signal and for dividing the periodic signal by an integer to generate the sampling rate

signal of the analog-to-digital converter" (Fig. 8 for a frequency divider circuit, and claim 1

above again for dividing the periodic signal in half to generate the local oscillator signal and for

dividing the periodic signal by an integer to generate the sampling rate as explained above).

(Claims 7-8 have been canceled).

For claim 9, in view of claim 1, Schick discloses "wherein the analog, frequency-

converted signal from the mixer is coupled directly to the analog-to-digital converter" (as shown

in Fig. 1, analog converted signal from mixer 168 is summing at 190 and coupled directly to

ADC 192).

(Claims 10-16 have been previously canceled).

Regarding claims 17-32, 34, and 36-37, these claims with same limitations addressed

above are rejected for the reasons given in the scope of claims 1-6, 9 and 35 as disclosed in view

of Schick and Hoenninger above and as below.

For claim 33, Schick further teaches "comprising: determining a receive frequency band

for the received signal and a sampling rate range for the analog to digital conversion; defining

limits for the frequency of the local oscillator signal in accordance with the receive frequency

band and the frequency of the sampling signal in accordance with the sampling rate range; and

selecting, within the defined limits, the frequency of the local oscillator signal and the frequency of the sampling rate signal so that the frequency of the local oscillator signal is an integer multiple of half of the frequency of the sampling rate signal" (col. 9/lines 20-33, and col. 10/line 1 to col. 11/line 38 for defined sampling windows for sampling rate ranges, and importantly, based on Nyquist criteria, all attributes and frequency configurations must be defined and limited within a limit to avoid aliasing as noted above).

For claim 35, in view of claim 1, Schick further discloses "comprising: an antenna; a front end for processing a radio frequency signal received via the antenna" (program source signals received from an antenna, col. 4/lines 58-61); and "digital processing circuitry for processing the digital signal" (col. 3/lines 50-62 for DSP or digital signal processing is included).

Conclusion

5.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

Shen et al, and Birgenheier et al. (PTO-892 attached) disclose systems related to RF

receiver with anti-aliasing techniques.

7.   **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to the New Central Fax number:

(571) 273-8300, (for Technology Center 2600 only)

Hand deliveries must be made to Customer Service Window,

Randolph Building, 401 Dulany Street, Alexandria, VA 22314.

8.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Tony Thuan Nguyen whose telephone number is (571) 272-7895.

The examiner can normally be reached on Monday-Friday from 9:30 AM to 7:00 PM, with

alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Edward Urban, can be reached at (571) 272-7899.

The Art Unit location of your application in the USPTO has changed. To aid in

correlating any papers for this application, all further correspondence regarding this application

should be directed to Division or Art Unit 2618.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TONY T. NGUYEN
PATENT EXAMINER

Tony T. Nguyen
Art Unit 2618
September 13, 2006